What We Claim Is:

1. A hydrogel composition comprising a hydrogel polymer reacted with an excess amount of cross-linker having two or more functional groups capable of cross-linking the polymer such that the polymer has a significant extent of cross-links to other hydrogel polymer molecules and also has a significant extent of cross-linkers with at least one functional group bound to a hydrogel polymer and at least one unbound functional group capable of reversibly cross-linking the polymer.

2. The hydrogel composition of claim 1, wherein the cross-linking efficiency of cross-linkers with at least one functional group bound to a hydrogel polymer and at least one unbound functional group capable of reversibly cross-linking the polymer is from 20 % to 90 %.

3. The hydrogel composition of claim 1, wherein the cross-linking efficiency of cross-linkers with at least one functional group bound to a hydrogel polymer and at least one unbound functional group capable of reversibly cross-linking the polymer is from 20 % to 70 %.

4. The hydrogel composition of claim 1, wherein the cross-linking efficiency of cross-linkers with at least one functional group bound to a hydrogel polymer and at least one unbound functional group capable of reversibly cross-linking the polymer is from 30 % to 50 %.

5. The hydrogel composition of claim 1, wherein the hydrogel polymer is an optionally oxidized polysaccharide.

6. The hydrogel composition of claim 1, wherein the hydrogel polymer is a natural or synthetic alginate, optionally hydrolyzed and/or oxidized.

7. The hydrogel composition of claim 6, wherein the cross-linked hydrogel has a weight average molecular weight of 1,000 to 50,000 dalton.

8. The hydrogel composition of claim 6, wherein the cross-linked hydrogel has a weight average molecular weight of 1,000 to 30,000 dalton.

9. The hydrogel composition of claim 6, wherein the cross-linked hydrogel has a weight average molecular weight of 1,000 to 10,000 dalton.

10. The hydrogel composition of claim 1 wherein the hydrogel polymer before cross-linking has a molecular weight such that it is at or below the renal threshold of humans.

11. The hydrogel composition of claim 5, wherein the cross-linker has at least two hydrazide functional groups.

12. The hydrogel composition of claim 5, wherein the cross-linker is adipic acid dihydrazide.

13. The hydrogel composition of claim 1, wherein the hydrogel has an initial shear modulus of 0.005 to 200 kPa.

14. The hydrogel composition of claim 1, wherein the hydrogel has an initial shear modulus of 0.05 to 100 kPa.

15. A method for tissue engineering, cell transplantation or drug delivery which comprises administering a composition comprising a hydrogel composition of claim 1.

16. The hydrogel composition of claim 5, wherein the polysaccharide is an aliginate, a dextran, a pullulan, a starch, an agarose or a hyaluronate.

17. The hydrogel composition of claim 1, wherein the cross-linker is a compound with at least two aldehyde groups and the hydrogel polymer is a polymer containing or modified to contain hydrazide groups.

18. The hydrogel composition of claim 1, wherein the hydrogel polymer is a synthetic polymer.

19. The hydrogel composition of claim 1, wherein the hydrogel polymer is a modified protein.